AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1.-25. (Cancelled)

26. (New) A light applicator with a diffusor which is attachable to a light guide and in which different diffusion regions with different scattering parameters follow successively along an optical axis of the light guide prolongated into the diffuser and in which the diffusion regions will overlap with respect to a line-of-sight aligned at a right angle to the optical axis of the light guide, wherein a boundary surface between adjacent diffusion regions has the shape of a laminar flow profile.

27. (New) A light applicator according to claim 26, wherein the boundary surface is formed in a paraboloidal way between the diffusion regions.

28. (New) A light applicator according to claim 26, whose diffusor comprises a mirror element at its distal end.

29. (New) A light applicator according to claim 26, wherein the scattering probability increases towards the distal end due to the chosen scattering parameters in the diffusion regions.

30. (New) A light applicator according to claim 29, wherein the concentration of scattering centers as averaged over the cross-sectional surface area increases along the optical axis towards the distal end of the diffusor.

31. (New) A light applicator according to claim 26, whose diffusor has a homogeneous distribution of light along the optical axis as a result of the scattering parameters in the diffusion regions.

32. (New) A light applicator according to claim 26, wherein the diffusor is associated with a reflection element by which the light emitted by the diffusor can be guided in a predetermined direction.

33. (New) A light applicator according to claim 32, wherein the reflection element is a spherical segment which is applied on the diffusor and which is provided on one outer side with a layer reflecting the light.

34. (New) A light applicator according to claim 32, wherein the transition between the light-emitting surface of the reflection element and the light-emitting surface of the diffusor is provided with a configuration which is specific to the organ.

35. (New) A light applicator according to claim 32, wherein the distribution of the power density of the light emitted by the diffuser along the optical axis has a local maximum in the region of the reflection element as a result of the chosen scattering parameters in the proximal diffusion regions.

36. (New) A light applicator according to claim 35, wherein the concentration of the scattering centers as averaged over the cross section has a local maximum in the region of the reflection element.

37. (New) A light applicator according to claim 35, wherein the concentration of scattering centers along the optical axis as averaged over the cross-sectional surface area shows a minimum between the proximal end and the distal end of the diffusor.

38. (New) A light applicator according to claim 32, wherein the distribution of light through the light-emitting surface of the reflection element and through the light-emitting surface of the diffusor is homogeneous.

39. (New) A light applicator according to claim 26, wherein the diffusion regions are produced on the basis of silicone.

40. (New) A light applicator according to claim 26, wherein scattering centers present in the diffusion regions are produced on the basis of TiO_2 or $BaSO_4$.

41. (New) A light applicator according to claim 26, wherein the diffusion regions are enclosed by a covering which has a smaller refractive index than the refractive index of the diffusion regions.

42. (New) A light applicator according to claim 26, whose light-emitting surfaces are covered by a partly backscattering layer.

43. (New) A light applicator according to claim 26, whose diffusor is provided with a flexible configuration.

44. (New) A light applicator according to claim 26, whose diffusor is provided with a rigid configuration.

45. (New) A method for producing a diffusor which is connectable to a light guide and in which different diffusion regions with different scattering parameters are formed along an optical axis of the light guide prolongated into the diffusor, wherein:
- a hollow body is used for the diffusor which is filled at least in sections with a first diffusion medium,
- a second diffusion medium is injected into the first diffusion medium and
- in the first diffusion medium a boundary surface shaped according to a laminar flow profile is formed between the first diffusion medium and the second diffusion medium as a result of the laminar flow of the second diffusion medium in the first medium.

46. (New) A method according to claim 45, wherein the boundary surface is formed in a paraboloidal way.

47. (New) A method according to claim 45, wherein the first diffusion medium and the second diffusion medium are each sucked into the hollow body.

48. (New) A method according to claim 45, wherein the second diffusion medium is injected from a first end of the hollow body into the first diffusion medium and a third diffusion medium is injected from a second end of the hollow body into the first diffusion medium.

49. (New) A method according to claim 45, wherein the diffusion media are cured.